

Appl. No. 10/786,373
Reply to Office Action of December 23, 2005

REMARKS

In the December 23, 2005 Office Action, claims 1-14 and 24-46 were rejected. Claims 15-23 were earlier withdrawn in response to a restriction requirement. This Response amends independent claims 1, 12, 24, 30, 34, 35, 38, and 40 and cancels claim 14. After entry of the foregoing amendments, claims 1-13 and 24-46 (36 total claims; 3 independent claims) remain pending in the application. Reconsideration of the application is respectfully requested in view of the above amendments and the following remarks.

I. Claims 1-10, 12, 13, and 24-31 Are Not Obvious

In the Office Action, the Examiner rejected claims 1-10, 12, 13, and 24-31 under 35 U.S.C. § 103(a) on the ground that these claims are unpatentable over U.S. Patent No. 5,595,529, issued to Cesna on January 21, 1997 (hereinafter "Cesna") in view of U.S. Patent No. 6,196,907, issued to Kahn on March 6, 2001 (hereinafter "Kahn"). Applicants respectfully traverse these rejections.

Amended claim 1 of the instant application is directed to an apparatus for abrading a work piece. The apparatus comprises a base and at least one support member physically coupled to the base. The at least one support member forms a plane. A carriage member is slidably mounted to the at least one support member and is coupled to the base only by the at least one support member forming the plane. At least one vertical drive mechanism is configured to reciprocate the carriage member in a vertical direction along the at least one support member. A spindle is rotationally mounted to the carriage member and is configured to rotate about a central axis. The spindle has a channel disposed longitudinally therethrough and is disposed outside the plane. The apparatus further comprises an upper abrading wheel that has a first working surface. The upper abrading wheel comprises a plurality of first conduits, each having a first orifice and a second orifice. The first orifice of each of the first conduits is disposed at the first working surface and the second orifice of each the first conduits is in fluid communication with the longitudinal channel of the spindle. A lower abrading wheel has a second working surface. The second working surface of the lower abrading wheel is disposed parallel to and in vertical opposition to the first working surface of the upper abrading wheel.

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Similarly, claim 24 is directed to an apparatus for abrading a work piece. The apparatus comprises a base and at least one support member that is fixedly attached to the base and that extends vertically from the base. The at least one support member forms a plane. A carriage member is slidably mounted to the at least one support member and at least partially extends in a direction substantially perpendicular to the plane. The carriage member is coupled to the base only by the at least one support member. At least one vertical drive means reciprocates the carriage member vertically along the at least one support member. A spindle is supported by the carriage member and is disposed outside the plane. The spindle is configured to rotate about a central axis and has a longitudinal channel that is configured to receive a fluid. A rotary drive means rotates the spindle about the central axis. A lower abrading wheel assembly is disposed partially within the base and comprises a lower abrading wheel with a first working surface. An upper abrading wheel assembly comprises an upper abrading wheel having a second working surface. The second working surface of the upper abrading wheel is disposed parallel to and in vertical opposition to the first working surface of the lower abrading wheel. The upper abrading wheel assembly comprises a fluid distribution system that is in fluid communication with the longitudinal channel of the spindle and is configured to distribute a fluid to the second working surface.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify a reference or to combine the teachings of multiple references. Second, there must be a reasonable expectation of success. Third, the prior art must teach or suggest all of the recited claim limitations. Of course, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure. Applicants respectfully submit that the Examiner has not met all of the above criteria because there is no suggestion or motivation to combine Cesna and Kahn.

As illustrated in FIG. 1 of Cesna, a spindle 20, which rotates an upper lap plate 12, lies within the plane of dual columns 26. Cesna discloses that a motor 108 that drives spindle 20 is mounted above a housing 106 that contains air cylinders 104. Air cylinders 104 drive vertical movement of upper lap plate 12 relative to a bridge 18. (Cesna, Col. 9, lines 40-50) Moreover, a center drive gear 74 of the lower lap plate 14 is driven by a drive mechanism 124, which is mounted to the top of bridge 18, via a shaft 86. (Cesna, Col. 10, lines 19-28)

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Further, a pair of vertically extending, telescoping sleeves 112 and 114 are provided, wherein the outer sleeve 112 is fixed to bridge 18 and defines a travel aperture through the center of bridge 18. The spindles 20 and 86 for rotating the upper lap plate 12 and the center drive gear 74, respectively, both extend through the sleeves 112 and 114, and thus extend through the center of bridge 18. (Cesna, Col. 9, lines 50-61)

Accordingly, it would not be obvious to redesign Cesna in view of Kahn so that the spindle of Cesna lies outside the plane of supports 26 of FIG. 1. As a preliminary matter, Cesna states that it uses its dual column design, with spindle 20 through the center of bridge 18 and, hence, within the plane of the dual columns "to minimize cantilevering during the lapping cycle" (Cesna, Col. 5, lines 13-15) Thus, Cesna explicitly teaches away from using a design in which the spindle lies outside of the plane of the columns. In addition, the combination of Cesna and Kahn would change this principle operation of Cesna and require significant redesign. As designed, the apparatus 10 of Cesna with its bridge 18 centered between dual columns 26, is balanced relative to the plane of the columns. Thus, during a lapping cycle, cantilevering is minimized. However, if the bridge 18 of Cesna was extended out from the plane of the dual columns so that spindle 20 did not lie in the plane, undesirable cantilevering would result. This is because the housing 106 with air cylinders 104, motor 108, drive mechanism 124, spindle 20, sleeves 112 and 114, and spindle 86 all would be disposed on one side of, and remote from, the plane of dual columns 26. (Even more cantilevering would occur if, instead of having dual columns 26, Cesna had only one column or support member.) A substantial reconstruction and redesign of the apparatus 10 of Cesna thus would be required to re-balance bridge 18. Such a reconstruction and redesign would change the basic principle of Cesna, that is, its dual column design with a centered spindle to minimize cantilevering. MPEP 2143.01 (citing *In re Ratti*, 270 F.2d 810 (CCPA 1959)). Accordingly, because there is no suggestion or motivation to combine Cesna and Kahn to obtain the inventions of independent claims 1 and 24, and hence claims 2-10, 12, 13, and 25-31 that depend therefrom, these claims are not obvious over Cesna in view of Kahn.

Further, Cesna in view of Kahn does not teach or suggest all of the recited claim limitations. With respect to claims 2 and 25 of the instant application, neither Cesna nor Kahn disclose a rotary coupler or describe how the upper abrading wheel rotates about its axis. With respect to claims 3 and 28, neither Cesna nor Kahn teach or disclose a rotary

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coupler having a driver hub, a universal joint mounted to the driver hub, or a housing mounted to the universal joint. Thus, these claims are not obvious.

In the Office Action, the Examiner also rejected claims 34-41 under 35 U.S.C. § 103(a) on the grounds that these claims are unpatentable over Cesna in view of U.S. Patent No. 4,007,560, issued to Janssen on February 15, 1977 (hereinafter "Janssen"). Applicants respectfully traverse these rejections.

Claim 34 of the instant application is directed to an apparatus for abrading a work piece. The apparatus comprises a base and at least one support member physically coupled to said base. The at least one support member forms a plane. A carriage member is slidably mounted to the at least one support member. The carriage member is coupled to the base only by the at least one support member. At least one vertical drive mechanism is configured to reciprocate the carriage assembly in a vertical direction along the at least one support member. A spindle is rotationally mounted to the carriage member and is disposed outside of the plane. The spindle is configured to rotate about a central axis. An upper abrading wheel assembly is coupled to the spindle and comprises an upper abrading wheel having a first working surface. A lower abrading wheel has a second working surface that is disposed parallel to and in vertical opposition to the first working surface of the upper abrading wheel.

It would not be obvious to redesign Cesna in view of Janssen so that the spindle of Cesna lies outside the plane of supports 26 of FIG. 1. The combination of Cesna and Janssen would change this principle operation of Cesna. As designed, the apparatus 10 of Cesna with its bridge 18 centered between dual columns 26, is balanced relative to the plane of the columns. Thus, during a lapping cycle, cantilevering is minimized. However, as described above, if the bridge 18 of Cesna was extended out from the plane of the dual columns so that spindle 20 did not lie in the plane, undesirable cantilevering would result. This is because the housing 106 with air cylinders 104, motor 108, drive mechanism 124, spindle 20, sleeves 112 and 114, and spindle 86 all would be disposed on one side of, and remote from, the plane of dual columns 26. (Even more cantilevering would occur if, instead of having dual columns 26, Cesna had only one column or support member.) Janssen minimizes cantilevering by using four (4) supports 22. The four supports 22 do not all lie within the same plane. Thus, not only would the combination of Cesna and Janssen change the basic principle of Cesna, that is, its dual column design to minimize cantilevering, such a combination would not result

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in the invention of claim 34. Accordingly, because there is no suggestion or motivation to combine Cesna and Kahn to obtain the invention of independent claim 34, and hence claims 35-41 that depend therefrom, these claims are not obvious over Cesna in view of Janssen.

In the Office Action, the Examiner also rejected claims 11, 14, 32, and 33 under 35 U.S.C. § 103(a) on the grounds that these claims are unpatentable over Cesna in view of Kahn and Janssen. Claim 14 has been cancelled. Claim 11 depends from claim 1 and claims 32 and 33 depend from claim 24. For the reasons set forth above that Cesna cannot be combined with Kahn and Janssen above, Applicants respectfully submit that a combination of Cesna, Kahn, and Janssen does not render claims 11, 32, and 33 obvious.

In the Office Action, the Examiner also rejected claims 42-46 under 35 U.S.C. § 103(a) on the grounds that these claims are unpatentable over Cesna in view of Janssen and Kahn. Claims 42-46 depend from claim 34. For the reasons set forth above that claim 34 is not rendered obvious, Applicants respectfully submit that a combination of Cesna, Kahn, and Janssen does not render claims 42-46 obvious. Further, Cesna in view of Janssen and Kahn does not teach or suggest all of the recited claim limitations. With respect to claim 43 of the instant application, Cesna, Kahn, and Janssen, alone or in combination, do not disclose a rotary coupler with fluid distribution channels. With respect to claim 44, Cesna, Kahn, and Janssen, alone or in combination, do not teach or disclose a rotary coupler having a driver hub, a universal joint mounted to the driver hub, or a housing mounted to the universal joint. Accordingly, claims 42-46 are not obvious over Cesna in view of Janssen and Kahn.

CONCLUSION

In conclusion, for the reasons given above, all claims now presently in the application are believed allowable and such allowance is respectfully requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the undersigned attorney at (480) 385-5060.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the

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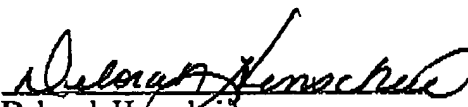
required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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APPENDIX